

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
27 May 2004 (27.05.2004)

PCT

(10) International Publication Number  
**WO 2004/045018 A1**

(51) International Patent Classification<sup>7</sup>: **H01P 1/20**,  
7/06, 7/04

(21) International Application Number:  
PCT/US2003/032743

(22) International Filing Date:  
7 November 2003 (07.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/424,620 7 November 2002 (07.11.2002) US

(71) Applicant (for all designated States except US): **SOPHIA WIRELESS, INC.** [US/US]; 14225 Sullyfield Circle, Suite C, Chantilly, VA 20151 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KOH, Phillip, J.** [US/US]; 5475 Owens Wood Court, Centreville, VA 20120 (US). **NEMETH, David, T.** [US/US]; 3521 Alton Place, Washington, DC 20008 (US).

(74) Agents: **FIELDS, Kenneth, W.** et al.; Sughrue Mion, PLLC, 2100 Pennsylvania Ave., NW, Suite 800, Washington, DC 20037-3213 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

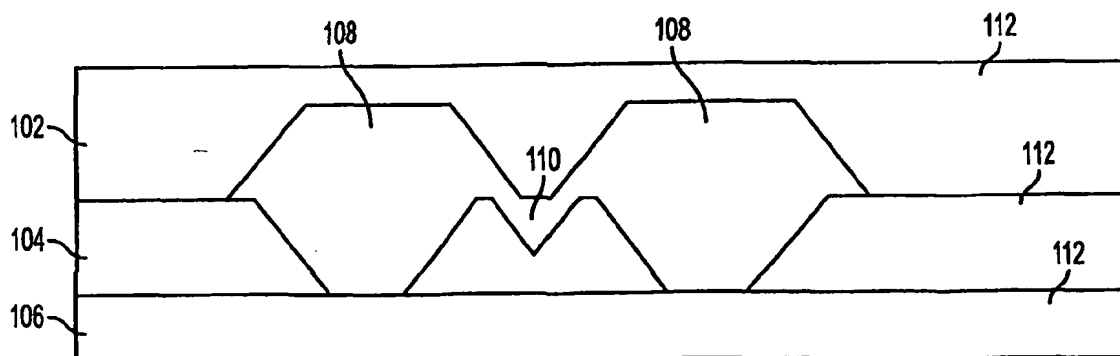
(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COUPLED RESONATOR FILTERS FORMED BY MICROMACHINING



(57) Abstract: A resonator filter assembly is provided having a first wafer (102), a second wafer (104) and a third wafer (106). A plurality of pits are etched in the first and second wafer (102, 104) and arranged such that a plurality of resonant cavities (108) are formed with a coupling cavity (110) disposed between the resonant cavities (108). By altering the dimensions of the resonant and coupling cavities (108, 110), the frequency characteristics of the filter can be adjusted as desired.